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PRO-DAIRY

Obtaining Utility Interconnection of On-site Generation

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Introduction

Interest in on-farm anaerobic digestion and on-site generation (OSG) has escalated in the recent past. Many diary producers made the decision to construct these systems as a means to offset the growing costs of electrical energy as well as to gain the other benefits of anaerobically digesting manure. Going from the point in time when a dairy farm owner decides to install anaerobic digester gas (ADG) fueled OSG to a fully operational system is a task that can be challenging and involves close coordination of several different activities.

This fact sheet is intended to assist the dairy producer in getting the OSG successfully connected to the grid. The task of constructing the digester and getting it operational to supply the biogas that fuels the OSG is not covered in this fact sheet.

Early Stages

The earliest stages of the process include the selection of a designer(s) for your digester and OSG system. There are a number of reputable digester/OSG design companies in the market place today and selection of the one that best fits the dairy farm's needs is crucial to overall success. Be sure to "kick the tires" and ask a lot of good questions as well as talk to owner/operators of existing systems. Find out what went right and what didn't. Getting out to see systems and ask questions about operation and maintenance of the OSG will provide insight to what the dairy farm is undertaking.

Once the design team is selected, it is critical for each team member to clearly understand exactly the scope of work they are responsible for under the overall project scope of work. What is expected of the design team and what is expected of the dairy farm owner/operator needs to be understood at the start of the project. If this is clearly understood up front, it is most likely everyone will be on good terms with each other at project completion.

In many cases, the owner becomes very involved with the interconnection of the generation to the utility grid. If this is how the project will work, that is fine. If the designer is assuming this role, this fact sheet will be useful to the owner in understanding the process and helping to keep it moving on schedule.

Initial information for OSG

At the earliest stages of the design, the design team should have ascertained the approximate daily manure production from the herd and converted this to a maximum kilowatt (kW) capacity for the generation. This needs to be determined up front as it will determine the capacity of the generation equipment in kW.

With that known, the designer will select the type and number of generators needed. Additionally, they will also have to design the protection package that will safely start the generation, synchronize it with the utility grid and monitor its operation when it is operating. This is accomplished through the use of electronic relays and circuit breakers that make up the generation control package.

The designer will distill this information into an engineering drawing that details sizes, capacities and types of components to be used. It is important to have this completed early in the project as this documentation and the drawings are needed to initiate the interconnection process with the utility. Lacking this, the utility will not be able to start their review process. Therefore, as the dairy farm owner, it will be important to follow up with the designer to make sure this work is completed early on and available for submission to the utility.

The utility may have technical questions regarding the design or equipment selected once the request has been submitted. If the dairy producer is handling the utility interconnection process, it will be important to have the technical support of the design team's electrical engineer when responding to these questions. Delays in responding to these questions usually result in an overall delay in the process. Design team technical support is very important at this phase.

Initiating contact with the utility

Depending on how the project responsibilities have been structured, the dairy producer may be making the interconnection request or the designer may be doing so. In either case, it is important to initiate the interconnection request at the earliest possible point in the project in order to allow the utility adequate time to process the request. Many dairy farmers that installed OSG early on were disappointed to learn that their interconnection request could not be processed quickly due to the need to review the equipment, analyze circuit behavior with the new generation and in some cases, construct new primary interconnections to the dairy farm. These delays extended in some cases to months. The best approach is to initiate the request as soon as all of the required engineering information is available.

Interconnection process

Each utility processes the request a little differently than the other but they are all required to conform to the "***NYS Standardized Interconnection Requirements and Application Process for New Distributed Generators 2MW or Less Connected in Parallel with Utility Distribution Systems***" **(SIR)**. This document can be found on the NYS Department of Public Service (PSC) website at http://www.dps.state.ny.us/distgen.htm. This document details the standard application process as well as system interconnection requirements and specifications. It is important to read and understand the process before contacting the utility. The SIR will not be detailed in this fact sheet but should be used by the applicant as a roadmap for the process.

The same website also has a listing of "***Certified Interconnection Equipment.***" This equipment list details equipment that has been tested by independent laboratories and approved by the Public Service Commission for use in grid interconnected systems. Use of equipment from this listing in the system can help to expedite the review process and should be given strong consideration by the design team.

Don't forget to check the website of the serving utility for related information and contacts: National Grid - www.nationalgridus.com; New York State Electric and Gas - www.nyseg.com; Rochester Gas and Electric – www.rge.com; Central Hudson – www.cenhud.com; Long Island Power Authority – www.lipower.org; and Con Edison – www.coned.com.

Cost involved with interconnection

The dairy producer is expected to pay various costs involved in the interconnection process. Outside of the initial application fee, the applicant will pay for the costs of any studies undertaken to determine the impact of the proposed OSG on the utility distribution system. These studies can run several thousand dollars. There may also be costs involved with the addition of specific equipment such as transformers and metering devices. An estimate of costs will be provided by the utility.

The applicant may also be required to pay construction costs associated with upgrading the distribution system to handle the new generation. These costs will vary based on the utility and condition of the distribution system serving the dairy farm. The total cost to interconnect will vary from location to location and utility.

Some may question the need and the cost involved for the study. However, a utility is required to ensure all customers that the interconnection of OSG on a distribution feeder will not create voltage, frequency, harmonics and other operational problems. The studies model the system and assess the overall impact. If there are negative issues, the utility will determine what may be required to correct or prevent such issues and ensure power quality for everyone connected to the feeder.

Will the system qualify for net metering?

Under current rules, systems as large as 500 kW that are ADG fueled can qualify for net metering provided they fall within the other requirements of the law. The maximum capacity was recently increased from 400 kW to 500 kW. At present, if the system exceeds 500 kW, it will not fall under this rule and would be handled as a non-utility generator. Excess energy would be sold into the grid under contract with the utility.

More information regarding net metering is provided in the fact sheet entitled ***"Net Metering for Farm Waste Electric Generating Systems in New York State"*** and can be found on the Pro-Dairy website.

Summary

The interconnection process for OSG requires a substantial amount of time and cooperation between the designer, applicant and utility. This process ensures the utility and its customers that the OSG system connected to the grid will operate successfully and not create problems for other customers. In order to insure timely accomplishment of the process, the following points should be remembered:

- ✓ Complete the electrical system design and equipment specifications as early as possible;
- ✓ Be sure that the electrical interconnection design is codes compliant with electrical (NEC, NESC and Local Codes) and utility requirements;
- ✓ To the extent possible, utilize equipment /components that have been PSC approved for grid connected systems;
- ✓ Contact the utility as soon as the electrical design documents and specifications are available;
- ✓ Study and understand the SIR and utilize it to track the progress of the interconnection request in the utility;
- ✓ Keep in regular contact with the utility's project representative to be aware of issues or questions needing response or action by the applicant;
- ✓ Once the project has been approved and accepted by the utility, keep the utility appraised of installation status and the estimated completion date to allow them to schedule construction needed to support the interconnect.